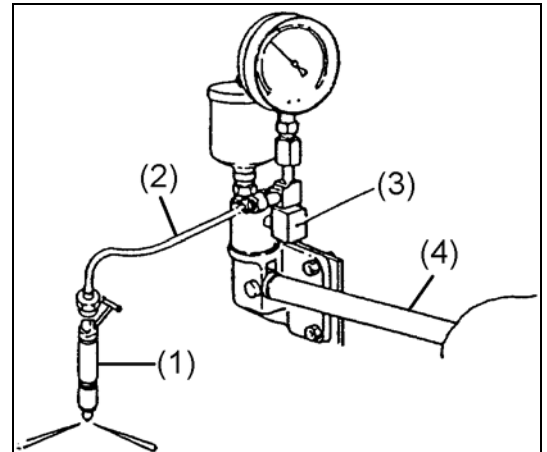


Injection nozzle pressure



Park the machine on level ground and secure it against rolling away and jack-knifing!
Lower the bucket, switch the engine off and actuate the parking brake!

1. Remove the injection pipes and close the connections. Remove the overflow lines.
 - ★ Make sure that no contamination enters the injection pump and injection valves.
2. Remove the injection valve brackets and remove the injection valves.
3. Remove carbon deposit at the nozzle hole thoroughly.
4. Connect the injection valve (1) to the high pressure pipe (2) of the nozzle tester (3).
5. Operate the lever (4) slowly and read the pressure at the moment when the injection from the nozzle starts.



Injection nozzle pressure (WA65-5 up to WA80-5):
207 - 211 bar

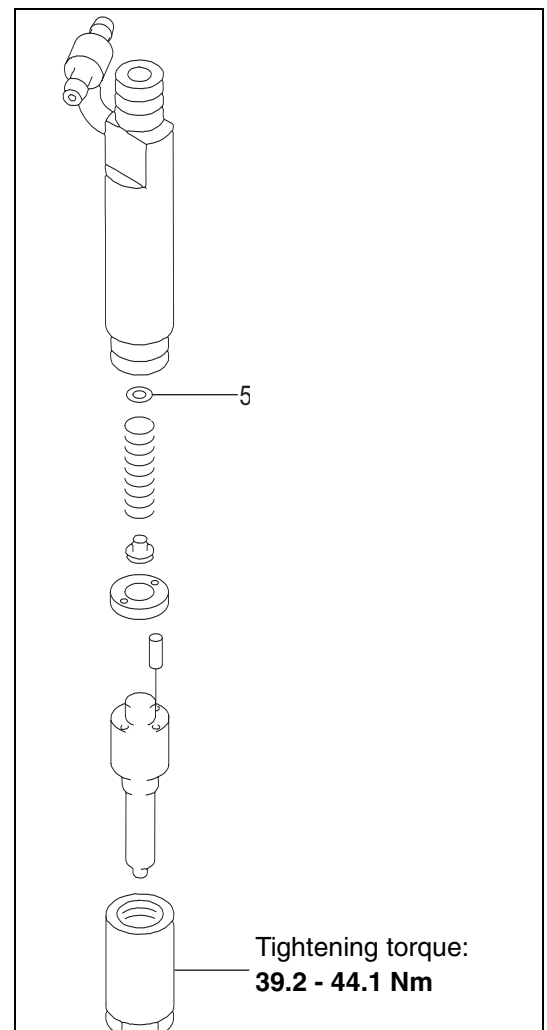
6. If the measured injection pressure is too low, replace the pressure adjusting shim (5) with a thicker one.

Available pressure adjusting shims:

1 × 0.1 mm	1 × 0.2 mm	1 × 0.3 mm
1 × 0.4 mm	1 × 0.5 mm	1 × 0.51 mm
1 × 0.52 mm	1 × 0.53 mm	1 × 0.54 mm
1 × 0.55 mm	1 × 0.56 mm	1 × 0.57 mm
1 × 0.58 mm	1 × 0.59 mm	

For the part numbers see the Komatsu parts book (injection system).

The injection pressure increases **approx. 14.7 bar**, when the adjusting shim thickness is increased by **0.1 mm**.



Fuel injection timing



Park the machine on level ground and secure it against rolling away and jack-knifing!

Lower the bucket, switch the engine off and actuate the parking brake!

If the injection pump is installed on the original machine and the pump has not been repaired:

1. Set the No. 1 cylinder at compression top dead center (TDC) by aligning the pointer (6) on the gear cover with the TDC line (1.4) on the crankshaft pulley.

★ The mark "C" can only be seen if the injection pump's cover is removed.

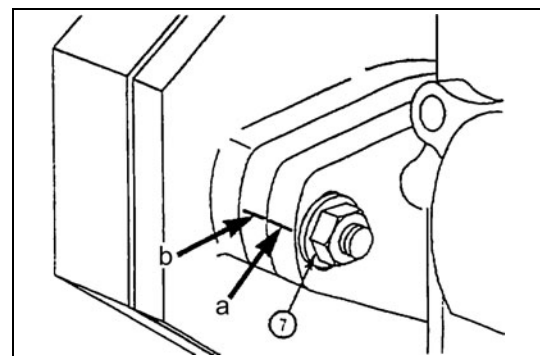
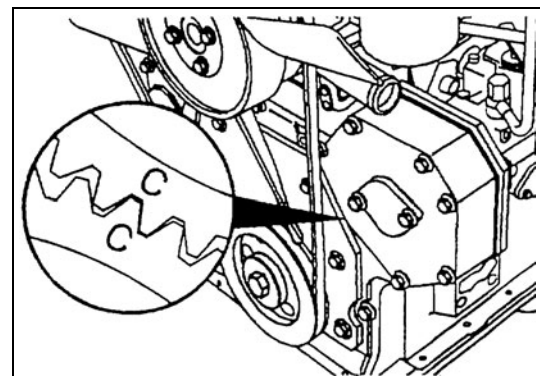
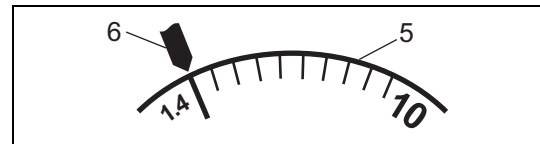
2. Confirm that the mark "C" can be seen on the idler gear. If the mark "C" cannot be seen, rotate the crankshaft one complete revolution and confirm that "C" can be seen.

3. Align the match mark "C" on the injection pump gear with the match mark "C" on the idler gear during installation for correct alignment.

4. Align the stamped line "a" on the injection pump with the stamped line "b" on the timing gear case during installation for correct alignment.

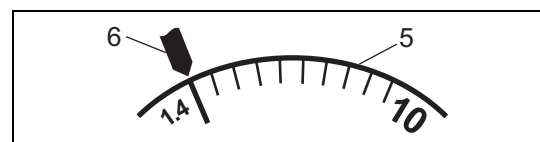
5. Install the injection pump.

6. If the stamped lines are out of alignment, loosen nut (7). Align the stamped lines by rotating the coupling. Tighten the nut.



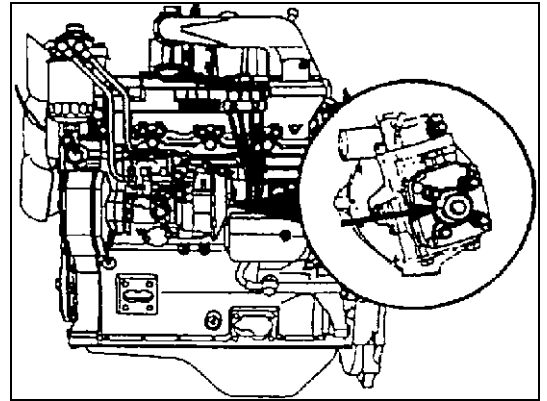
If an injection pump is installed to the engine that has been repaired:

1. Set the No. 1 cylinder at compression top dead center (TDC) by aligning the pointer (6) on the gear cover with the

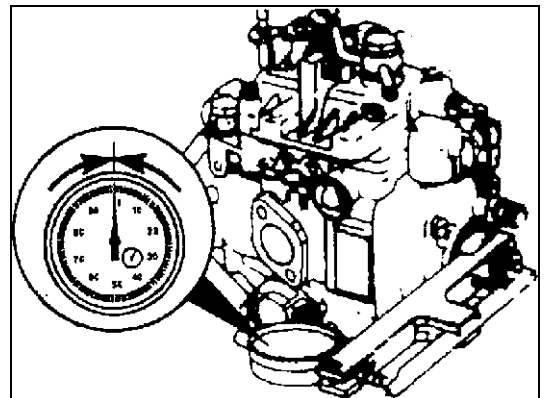


TDC line (1.4) on the crankshaft pulley.

2. Remove the distributor head bolt and copper washer from the injection pump. Discard the copper washer.

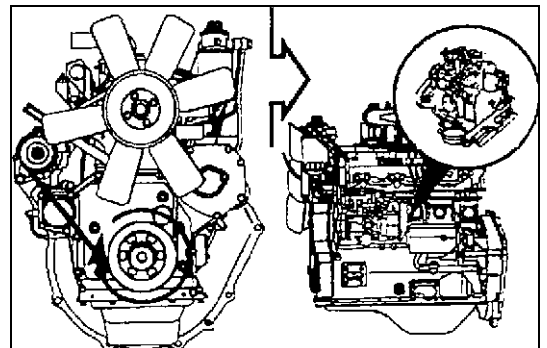


3. Install the dial gauge into the distributor head, so that the stylus end of the dial gauge contacts the plunger head.
4. Slightly rotate the crankshaft in the opposite normal direction (counterclockwise) until the dial gauge does not move any longer.
5. Set the dial gauge pointer to 0.



6. Rotate the crankshaft in the normal direction (clockwise) without stopping until it reads 1.0 ± 0.3 mm.
7. The pointer on the crankshaft must point to the timing mark (in degrees) on the crank pulley as indicated on the dataplate. The timing marks on the crank pulley range from 6 to 14 degrees in two degree increments.

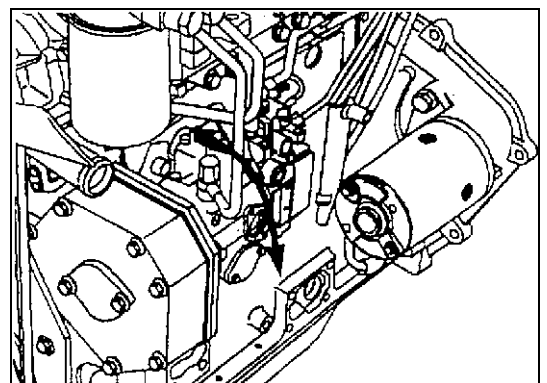
- ★ Check the values on the dataplate. Values may change as new ratings are developed.
- ★ The gauge reading ± 0.03 mm (0.001 in) is equivalent to ± 0.5 degrees fuel injection timing.



8. If the dial gauge reading is not within the standard value, loosen the nut and adjust the fuel injection timing by rotating the injection pump body. Tighten the nut.
9. Remove the dial gauge. Install the distributor head bolt and a new copper washer into the injection pump. Tighten the bolt.

 14 - 20 Nm

10. Stamp a match mark on the injection pump and the timing gear case.



V-belt tension



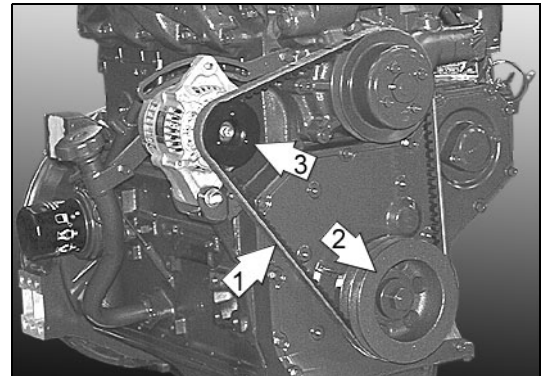
Park the machine on level ground and secure it against rolling away and jack-knifing!
Lower the bucket, switch the engine off and actuate the parking brake!

1. Press the fan belt at position (1) between the crankshaft pulley (2) and the alternator pulley (3) with a finger (59 N, 6 kg).

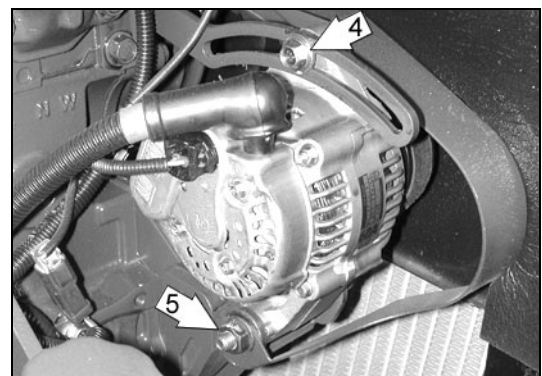
The tension is correct if the deflection at position (1) is **between 7 and 10 mm**.



Do not adjust the belt tension to maximum. The tension can rise when the locking nut is tightened. The life of the pulleys and bearings is reduced if the tension is too high!



2. Adjusting the fan belt tension
 - a. Release the locknut (4) and the nut (5).
 - b. Tense the V-belt by applying a lever between the engine block and the alternator.
 - c. After having adjusted the tension tighten the locknut (4) and the nut (5).
 - d. Check the tension again to make sure it is not too high.



Engine RPM



Do not touch hot engine parts during fitting or removing test equipment!

★ Testing conditions

- Normal engine working temperature
- Hydraulic oil temperature: 50 - 60°C

1. Fit the RPM tester to the engine.
2. Note the low idle RPM, when the engine has reached working temperature.

Low idle RPM: **800 - 825 rpm**

3. If the low idle RPM is not correct, screw the adjusting screw (1) to set the low idle RPM.

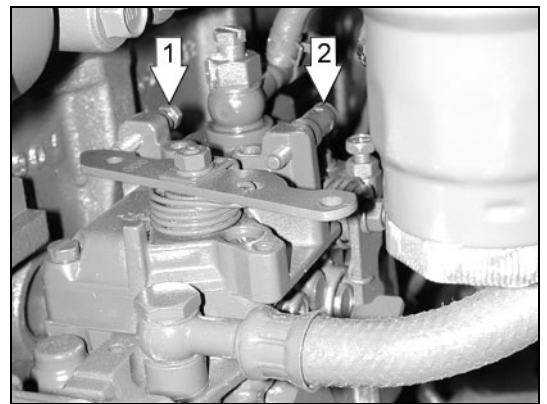
- ★ Screwing the adjusting screw in increases the RPM.
Screwing the adjusting screw out decreases the RPM.

4. Slowly rise the RPM (no load) and note the high idle RPM.

High idle RPM: **2600 - 2700 rpm**

5. If the high idle RPM is not correct, screw the adjusting screw (2) to set the high idle RPM.

- ★ Screwing the adjusting screw in decreases the RPM.
Screwing the adjusting screw out increases the RPM.



RPM-dependant drive take-up



Make sure that the test area is safe!

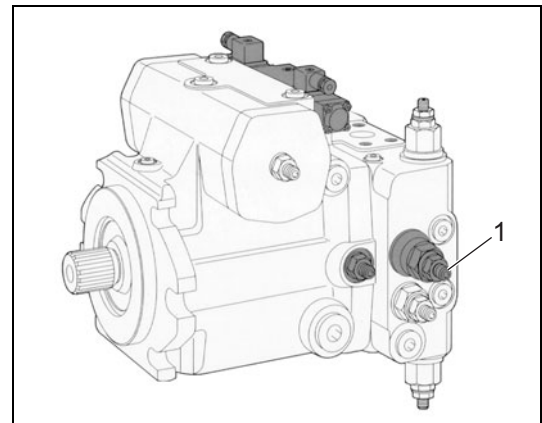
★ Testing conditions

- Normal engine working temperature
- Hydraulic oil temperature: 50 - 60°C
- Ground: flat, even, dry and hard surface
- Tyre pressure: recommended pressure

Testing

1. Fit the RPM tester to the engine and take the RPM tester's display into the cab.
2. Release the parking brake and select FORWARD.
3. Press the accelerator pedal and increase the engine RPM slowly.
4. Note the indicated engine speed, when the machine just starts to move forward.

Engine speed at drive start: **1050 - 1150 RPM**



Adjusting

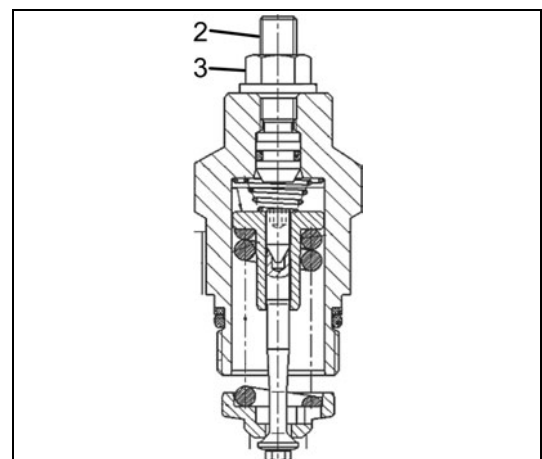


Stop the engine before adjusting the oil pressure!

1. Release the locknut (3) of the regulating valve (1).
2. Adjust the setting with the adjusting screw (2).

To rise the RPM-dependant drive take-up	screw in
To lower the RPM-dependant drive take-up	screw out

- ★ Repeat the test to check that the drive take-up is in the given limits.



Engine stall torque RPM



- Do not touch hot engine parts during fitting or removing test equipment!
- Chock the wheels!

★ Testing conditions

- Normal engine working temperature
- Hydraulic oil temperature: 50 - 60°C

1. Fit the RPM tester to the engine and take the RPM tester's display into the cab.
2. Block the drive train (1). Make sure that the wheels cannot slip during the test.
 - ★ Make sure that the correct low and high idle speeds are adjusted and that the oil pressures is in between the set limits. If these are not correct, check the connections and the linkages.



Engine stall torque RPM, test with the hydrostatic drive



Clear the possible danger area, in case the machine becomes free from the safety arrangements!

1. Run the engine in low idle.
2. Release the parking brake.
3. Select FORWARD.
4. Press the brake pedal and slowly rise the engine RPM to max.
 - ★ Make sure that the wheels do not turn during the test.
5. Note the maximum engine RPM when the engine is under hydrostatic load.
 - ★ Do not hold this test condition for more than 20 sec. Check that the oil temperature does not exceed 60°C.

Engine stall speed against hydrostatic: **2580 - 2650 RPM**